

Attorney Docket No. AHUG.011  
Serial No. 10/633,471  
Response to Office Action dated 2/01/2005

### C. CLAIMS AS AMENDED

1. (~~Currently Amended~~) An apparatus ~~for joining two tubing sections together, comprising:~~
  - a first tubing and a second tubing;
  - a plug assembly fixedly engaged to a first tubing proximate end and having a plurality of first splines and a plurality of first connectors;
  - a socket assembly fixedly engaged to a second tubing distal end and having a plurality of receptacles adapted to receive the plurality of splines and a plurality of second connectors of the plug assembly;
  - a securing device for securing the plug assembly to the socket assembly;
  - wherein the plug assembly may be joined to and the socket assembly by the securing device ~~may be joined in N a plurality of orientations where N is equal to the number of splines so that, in each of the plurality of orientations, when the plurality of splines in the plug assembly mate with the plurality of receptacles in the socket assembly, the plurality of first connectors engage the plurality of second connectors.~~
2. (Original ) The apparatus of claim 1, wherein the plurality of splines further comprises a center spline and a plurality of outer splines of equal dimensions, the outer splines sharing a common longitudinal axis with the center spline and having symmetry about the common longitudinal axis, and where N is equal to the number of outer splines.

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3. (Original ) The apparatus of claim 1, wherein the securing device is a coupling collar adapted for connecting it to the plug assembly and the socket assembly, the coupling collar initially engaged with the plug assembly.
4. (Original ) The apparatus of claim 1, wherein the plug assembly further comprises fine threads.
5. (Original ) The apparatus of claim 1, wherein the socket assembly further comprises coarse threads.
6. (Original ) The apparatus of claim 5, wherein the threads of the socket assembly are tapered.
7. (Original ) The apparatus of claim 1, wherein the two tubing sections are connectable in two distinct orientations.
8. (Original ) The apparatus of claim 1, wherein the two tubing sections are connectable in three distinct orientations.
9. (Original ) The apparatus of claim 1, wherein the two tubing sections are connectable in four or more distinct orientations.
10. (Original ) The apparatus of claim 1, further comprising at least one conduit containing a wire adapted to carry an electrical current.
11. (Original ) The apparatus of claim 1, further comprising at least one conduit containing material adapted to carry an optical signal.
12. (Original ) The apparatus of claim 1 wherein the tubing sections are tubing.
13. (Original ) The apparatus of claim 1 wherein the tubing sections are pipe.
14. (Original ) The apparatus of claim 1 wherein the tubing sections are casing.
15. (Original ) The apparatus of claim 1 wherein the tubing sections are used to produce hydrocarbons from a well bore.

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16. (Original ) The apparatus of claim 1 wherein the tubing sections are used to produce water from a well bore.

17. (Original ) The apparatus of claim 1 wherein the tubing sections are connectable in a plurality of distinct orientations.

18. (Currently Amended ) An apparatus for providing power to a subterranean environment, comprising:

a drilling assembly containing a plurality of tubing sections;

a plurality of tubing joints for connecting the plurality of tubing sections together, the each tubing joints comprising:

a plug assembly having a plurality of splines;

a socket assembly having a plurality of receptacles, the plurality of receptacles adapted to receive the plurality of splines of the plug assembly;

~~at least one~~ a plurality of conduit transmission means running the length of the apparatus;

a securing device for securing the plug assembly of one tubing section to the socket assembly of another tubing section; and

wherein the plug assembly of one tubing section and the socket assembly of another tubing section may be joined in N orientations where N is equal to the number of splines; and

wherein the plurality of transmission means are aligned for connectivity when the plurality of splines on one tubing joint are inserted into the plurality of receptacles on another tubing joint.

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19. (Original ) The apparatus of claim 18, wherein the plurality of splines further comprises a center spline and a plurality of outer splines of equal dimensions, the outer splines sharing a common longitudinal axis with the center spline and having symmetry about the common longitudinal axis, and wherein N is equal to the number of outer splines.

20. (Original ) The apparatus of claim 19, wherein the securing device is a coupling collar adapted for connection to the plug assembly and the socket assembly, the coupling collar initially engaged with the plug assembly.

21. (Original ) The apparatus of claim 19, wherein the plug assembly further comprises fine threads.

22. (Original ) The apparatus of claim 19, wherein the socket assembly further comprises coarse threads.

23. (Original ) The apparatus of claim 22, wherein the threads of the socket assembly are tapered.

24. (Original ) The apparatus of claim 19, wherein the two tubing sections are connectable in two distinct orientations.

25. (Original ) The apparatus of claim 19, wherein the two tubing sections are connectable in three distinct orientations.

26. (Original ) The apparatus of claim 19, wherein the two tubing sections are connectable in four or more distinct orientations.

27. (Original ) The apparatus of claim 19, further comprising at least one conduit containing a wire adapted to carry an electrical current.

28. (Original ) The apparatus of claim 19, further comprising at least one conduit containing material adapted to carry an optical signal.

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29. (Original ) The apparatus of claim 19 wherein the tubing sections are tubing.
30. (Original ) The apparatus of claim 19 wherein the tubing sections are pipe.
31. (Original ) The apparatus of claim 19 wherein the tubing sections are casing.
32. (Original ) The apparatus of claim 19 wherein the tubing sections are used to produce hydrocarbons from a well bore.
33. (Original ) The apparatus of claim 19 wherein the tubing sections are used to produce water from a well bore.
34. (Original ) The apparatus of claim 19 wherein the tubing sections are connectable in a plurality of orientations.
35. (Currently Amended) A method of using a tubing joint to join two tubing sections together, comprising:
- using a first tubing section having a plurality of first connectors and with a proximate end having a plug assembly attached and using a second tubing section having a plurality of second connectors and with a distal end having a socket assembly attached, positioning the first tubing section coaxially with the second tubing section;
  - aligning the first tubing section with the second tubing section;
  - engaging the plug assembly of the first tubing section into the socket assembly of the second tubing section so that the plurality of first connectors engage the plurality of second connectors; and
  - securing the first tubing section to the second tubing section.

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36. (Original ) The method of claim 35 wherein the positioning step further comprises:  
positioning the first tubing section coaxially with the second tubing section such that the proximate end of the first tubing section is in close proximity with the distal end of the second tubing section.

37. (Original ) The method of claim 35 wherein the positioning step further comprises:  
aligning the first tubing section with the second tubing section by rotating one or both tubing sections such that the plug assembly outer splines of the first tubing section are positioned to properly mate with the receptacle in the socket assembly of the second tubing section.

38. (Original ) The method of claim 35 wherein the first tubing section is vertically above the second tubing section.

39. (Original ) The method of claim 35 wherein a pair of electrical connectors are electrically coupled when the plug assembly of the first tubing section is inserted into the socket assembly of the second tubing section.

40. (Original ) The method of claim 35 wherein a pair of optical connectors are optically coupled when the plug assembly of the first tubing section is inserted into the socket assembly of the second tubing section.

41. (Original ) The method of claim 35 wherein the coupling collar of the first tubing section is used to secure the first tubing section to the second tubing section.

42. (Original ) The method of claim 35 wherein the tubing sections are tubing.

43. (Original ) The method of claim 35 wherein the tubing sections are pipe.

44. (Original ) The method of claim 35 wherein the tubing sections are casing.

45. (Original ) The method of claim 35 wherein the tubing sections are used to produce hydrocarbons from a well bore.

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46. (Original ) The method of claim 35 wherein the tubing sections are used to produce water from a well bore.

47. (Currently Amended) In a drill string of the type comprising a plurality of drill pipe sections arranged in end to end relation from a location above the ground to a lower location adjacent to an orientable tool connected to a bottom end of the drill string and wherein the adjacent ends of the drill pipe sections are connected to each other to form a plurality of spaced pipe joints extending downwardly from the ground to the tool, the improvement which comprises manufacturing the drill string so that the same is in alignment from the top to the bottom thereof and wherein each pipe section is provided with a lower end having a plurality of splines downwardly-projecting-extension and an upper end having a complementary-recessplurality of receptacles which is in alignment with and corresponds with the downwardly-projecting-extensionplurality of splines on the lower end of the same pipe section, and wherein each pipe joint comprises an upper drill pipe section having its downwardly-projecting-extensions splines received in the corresponding recesses receptacles in the next adjacent lower drill pipe section and wherein the extensions-splines and the recessesreceptacles can fit together in more than one orientation, wherein the adjacent ends of the sections are threaded and wherein an internally threaded collar is received over the threaded ends to hold the sections of each pipe joint securely together, and wherein a plurality of connectors are aligned for connectivity when the splines of the upper drill pipe section are received in the corresponding receptacles in the next adjacent drill pipe section.

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48. (Original ) A drill pipe joint as set forth in claim 47 wherein the upper drill pipe section and lower drill pipe section are provided with keyways which are symmetrically related with respect to the longitudinal axis of the drill string and wherein keys are affixed to the keyways of the upper drill section and are adapted to fit into the keyways of the lower drill pipe section.

49. (Original ) A drill pipe joint as set forth in claim 47 wherein the upper drill pipe section is provided with at least three downwardly extending legs which are symmetrically arranged with respect to the longitudinal axis of the drill string and wherein the lower drill pipe section is provided with a corresponding number of recesses arranged so as to receive the legs of the upper drill pipe section.

50. (Currently Amended) An apparatus for connecting a plurality of casing sections together comprising:

a first casing section;

a second casing section removably connected to the first casing section; and

wherein the first casing section and the second casing section are connectable in a plurality of distinct orientations;

wherein a first plurality of transmission means are adapted for location within the first casing section and a second plurality of transmission means are adapted for location within the second casing section; and

wherein in each of the plurality of distinct orientations, the first plurality of transmission means are aligned for connectivity with the second plurality of transmission means by means of a mating of a plurality of splines and a corresponding plurality of receptacles.



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51. (Original ) The apparatus of claim 50 wherein the connection between the first casing section and the second casing section comprises: a means for connecting the first casing section to the second casing section in a plurality of distinct orientations.

52. (Original ) The apparatus of claim 50 wherein the connection between the first casing section and the second casing section comprises:

a plug assembly having a plurality of splines affixed to the first casing section;

a socket assembly having a plurality of receptacles adapted to receive the plurality of splines of the plug assembly, the socket assembly being affixed to the second casing section;  
and

a securing device for securing the plug assembly to the socket assembly.

53. (Original ) The apparatus of claim 52, wherein the securing device is a coupling collar adapted for connection to the plug assembly and the socket assembly, the coupling collar initially engaged with the plug assembly.

54. (Original ) The apparatus of claim 53, wherein the plug assembly further comprises fine threads.

55. (Original ) The apparatus of claim 53, wherein the socket assembly further comprises coarse threads.

56. (Original ) The apparatus of claim 55, wherein the threads of the socket assembly are tapered.

57. (Original ) The apparatus of claim 52, wherein the two tubing sections are connectable in two distinct orientations.

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58. (Original ) The apparatus of claim 52, wherein the two tubing sections are connectable in three distinct orientations.
59. (Original ) The apparatus of claim 52, wherein the two tubing sections are connectable in four or more distinct orientations.
60. (Original ) The apparatus of claim 52, further comprising at least one conduit containing a wire adapted to carry an electrical current.
61. (Original ) The apparatus of claim 52, further comprising at least one conduit containing material adapted to carry an optical signal.
62. (Original ) The apparatus of claim 52 wherein the tubing sections are tubing.
63. (Original ) The apparatus of claim 52 wherein the tubing sections are pipe.
64. (Original ) The apparatus of claim 52 wherein the tubing sections are casing.
65. (Original ) The apparatus of claim 52 wherein the tubing sections are used to produce hydrocarbons from a well bore.
66. (Original ) The apparatus of claim 52 wherein the tubing sections are used to produce water from a well bore.

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For the foregoing reasons, the Applicant submits that the claims of the present application are not fairly taught by any of the references of record, taken either alone or in combination. Therefore, allowance of the present application is in order, and is requested.

Respectfully submitted,

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On 6/28/2005  
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